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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,588	03/31/2004	Michael A. Moser	16869Q-084600US	8426

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EXAMINER

GLASS, ERICK DAVID

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,588	Applicant(s) MOSER ET AL.	
	Examiner Erick Glass	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,16-21 and 23 is/are allowed.
- 6) ☐ Claim(s) 1,2,4,5,8-10,12,13,22,24-26 is/are rejected.
- 7) ☒ Claim(s) 6,7,11,14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 8, 9, 10, 12, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Menegoli (5,504,402).

With respect to claim 1, Menegoli discloses disk drive control circuit having control logic (Fig. 2, logic is circuitry excluding the vcm and the spindle motor), wherein the control logic is configured to enter a regenerative braking state during normal operation where the switching elements are controlled to isolate the spindle from the first supply voltage supply node (Fig. 2, #s 102, 104, 106, 108, 110, 112, 122, 128, 124 are the switches and isolate the spindle motor from Vcc during regenerative braking) and cause regenerative braking of the spindle motor so that kinetic energy is converted to electrical power that is supplied to the head motor by virtue of inductance of one or more motor windings in the set (col. 2, lines 47-63; "parking" is interpreted as a normal operation, and the back-emf is supplied to the vcm via by charging the capacitor 126 located at a second node; also, "any condition" implies that the system does not have to experience an abrupt or unexpected loss of power, but, rather, the system could command a park condition when the user turns off the power switch; i.e., commanded park situation).

With respect to claim 8, Menegoli discloses a control circuit for a disk drive comprising; a control circuit that operates at specified times during normal operation to cause the switching element to prevent current flow between the first voltage supply node and the motor supply node (Fig. 2, #s 102, 104, 106, 108, 110, 112, and 128 prevent current from flowing to node connecting 124, 126, 132 while the system is not commanded into a parking state); the control circuit configures the spindle drive motor to cease driving the spindle motor and allow the spindle motor to supply current to the motor supply node (col. 2, lines 47-63; in a park condition, the spindle motor is not driven and back-emf is supplied to the vcm); and the control circuit configures the head motor drive circuit to energize the head motor with current flowing from the first voltage supply node and current supplied by the spindle motor (col. 2, lines 47-63; with back-emf sent to the capacitor).

With respect to claims 4 and 9, at least one of the switching elements is configured as a boost circuit to boost the back-emf (col. 2, lines 55-61; "stepping up" or "kicked-up").

With respect to claim 10, the boost circuit operates during the normal braking state (col. 2, lines 47-50; where "any condition" implies that the system does not have to experience an abrupt or unexpected loss of power, but, rather, the system could command a park condition when the user turns off the power switch; i.e., commanded park situation).

With respect to claim 12, Menegoli discloses a circuit for controlling a spindle motor and a head motor comprising: first and second voltage supply nodes (Fig. 2, Vcc

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and node after 122); a switching element coupled between the first supply node and the second supply node (Fig. 2, #122); a spindle motor drive circuit coupled between the motor supply node and the second voltage supply node (Fig. 2, #s 102, 104, 106, 108, 110, 112 between node after 122 and motor supply node, which is the node connecting #s 124, 126, 132); the spindle motor drive circuit has node for coupling to respective spindle connection nodes (Fig. 2, #s 102, 104, 106, 108, 110, 112 connected to #s 12, 14, and 16); a head motor drive circuit coupled between the motor supply node and the second voltage supply node, where the head motor drive circuit includes nodes for coupling to respective head motor connection nodes (Fig. 2, #128 between node connecting #s 124, 126, 132, and node after #122); a boost circuit coupled between the first voltage supply node and the motor supply node (col. 2, lines 55-63; steps up the back-emf); a control circuit coupled to the switching element, the spindle motor drive circuit, the head motor drive circuit, and the boost circuit (Fig. 2, #100); the control circuit is configured with a set of one or more spindle motor drive states, where the switching element is set to allow current flow between the first voltage supply node and the motor supply node, the spindle motor drive circuit is configured to energize the spindle motor with current flowing between the motor supply node and the second voltage supply node, and the boost circuit is not activated; the control circuit being configured to set one or more regenerative braking states, where the switching element is set to prevent current flow between the first voltage supply node and the motor supply node, the spindle motor drive circuit allows the spindle motor to supply current to the motor supply node, the boost circuit is activated to allow current to flow from the first

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voltage supply node to the motor supply node, and the head motor drive circuit energizes the head motor with current flowing from the first voltage supply node and the current supplied by the spindle motor (col. 2, lines 47-63; in non-park mode, the system does not supply current to the vcm via the spindle motor's back-emf; therefore, no need to use the boost section. In park the system turns off the spindle motor and supplies back-emf to the vcm via the "boost" section).

With respect to claim 26, Menegoli discloses a disk drive comprising'. a disk having concentric tracks for storing information; a head for reading and/or writing information to the disk (col. 3, lines 50-59; read-write heads); a spindle motor having a set of windings for rotating the disk (Fig. 2, #18); a head motor for moving the head to access selected tracks (Fig. 2, #132); a spindle motor drive circuit (Fig. 2, #s 100, 102, 104, 106, 108, 110, 112); a head motor drive circuit (Fig. 2, #s 128, 126, 138); first and second voltage supply nodes for connection to a source of electrical power for the spindle motor and the head motor (Fig. 2, Vcc and node after 122); a selective isolation switching element coupled between the first supply node and a motor supply node (Fig. 2, #128 between node after 122 and node connecting #s 124, 126, 132), the spindle motor drive circuit and the head motor drive circuit being coupled between the motor supply node and the second supply node (Fig. 2, #s 102, 104, 106, 108, 110, 112, and 128 between node after 122 and node connecting #s 124, 126, 132); motor control logic coupled to the spindle motor drive circuit, the head motor drive circuit, and the selective isolation switching element (Fig. 2, #100), where the control logic enters a regenerative braking state during normal operation and where the selective switching element is

controlled to isolate the spindle motor from the first supply voltage node, and the spindle motor drive circuit and the head motor drive circuit are controlled to cause regenerative braking of the spindle motor so as to supply the head motor with electrical power (col. 2, lines 47-63).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menegoli as applied to claim 1 above, and in view of Suzuki (2004/0080858).

Menegoli discloses sensing a commanded power-down condition to put the system in the regenerative state (col. 2, lines 47-50; "in any condition" implies that the system does not have to experience an abrupt or unexpected loss of power, but, rather, the system could command a park condition when the user turns off the power switch; i.e; commanded park situation), but does not disclose the recharging a battery in the regenerative state.

Suzuki discloses that a storage battery could include a capacitor ([0006]). The motivation to use a battery is because it can store more power than can a capacitor alone. Therefore; it would have been obvious to one having ordinary skill in the art at the time of the invention to add to the capacitor of Menegoli, as battery. Adding the battery allows the storage system to store more power, which provides the advantage of

ensuring that there is enough power to fully retract or park the head when power is turned off.

Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menegoli as applied to claims 1 and 12 above, and in view of Goretzki et al. (6,094,020).

Menegoli does not disclose the limitations of claims 5 and 13.

Goretzki et al. teaches entering the regenerative state for a seek operation (col. 5, lines 29-56). The motivation to use the regenerative energy during a seek operation is to decrease the seek time. Therefore, it would have been obvious to one having ordinary skill in the m at the time of the invention to implement the regenerative state in Menegoli during a seek operation, thereby providing the advantage of reducing the seek time, as taught by Goretzki et al.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menegoli (5,504,402).

With respect to claim 22, Menegoli discloses a device use in a disk drive system comprising: circuitry that operates during normal condition so that the control logic controls the switching elements to provide electrical power to the spindle motor and the head motor from a voltage source coupled to first and second voltage supply nodes; the control logic enters a regenerative braking state during normal operation, wherein at least one of the switching elements is controlled to isolate the spindle motor from the first supply voltage node; and at least some of the switching elements are controlled to cause regenerative braking of the spindle motor so that kinetic energy is converted to

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electrical power that is supplied to the head motor by virtue of inductance of the motor windings (col. 2, lines 47-63).

Menegoli does not explicitly disclose a chip set having a plurality of switching elements incorporated in one or more semiconductor devices and an integrated circuit device having drive control circuitry. With respect to this feature, the examiner takes Official Notice. It is well known in the art and would have been obvious to one having ordinary skill in the art at the time of the invention to implement the control circuitry for driving the spindle motor and the voice coil motor in a chip set having the claims limitations (semiconductor devices and integrated circuit device). The motivation to use a chip set is because this allows for a standardized package that functions, as claimed, to be used in a disk drive unit. This provides the advantage of increasing manufacturing efficiency. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement the control and drive circuitry of Menegoli into a chipset, thereby providing the advantage of increasing efficiency of manufacturing disk drive units. See also the non-patent literature submitted by the applicants.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menegoli as applied to claim 22 above.

Menegoli does not disclose the limitations of claims 24 and 25. With respect to these features, the examiner takes Official Notice. It is well known and would have been obvious to one having ordinary skill in the art at the time of the invention that the switching elements could be incorporated either in a single semiconductor chip or more than one semiconductor chip. The motivation to choose single or plural chips is a design

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choice. Choosing one chip provides at least the advantage of likely occupying less space than would two chips because the interconnection circuitry between the two chips is not needed. Choosing more than one chips provides at least the advantage of being able to replace only a particular unit should a relatively minor component malfunction in that particular unit. This would save costs because of not having to replace all of the switching units.

Allowable Subject Matter

Claims 3, 16-21, 23 are allowed.

Claims 6,7,11,14,15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 4/7/06 have been fully considered but they are not persuasive. The 35 U.S.C. 112, second paragraph rejections of claims 1-11, and 22-26, are withdrawn. The amendments to the specification and claim informalities are welcomed.

The applicant argues that Menegoli use of regenerative braking in the event of a power failure and this is how the claim language is different over the Prior Art. While the applicant states that under normal conditions the control system enters a regenerative braking state, there is no claim language disclosing how this is different than the Prior Art. Normal is broad term language, which could vary greatly from system to system. But as stated by the applicant a change has to occur for

regeneration to start, so that is being interpreted as coming out of a "normal operation". And for the system to enter a regenerative braking state and transfer power to the head motor, the spindle motor must stop (or cease) to produce the back emf for regeneration to occur. All of which is covered by the Prior Art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

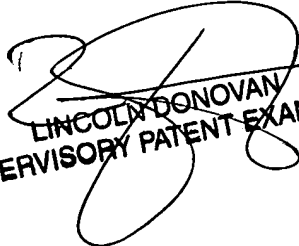
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Glass whose telephone number is 571-272-8395. The examiner can normally be reached on 8-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EG


LINCOLN DONOVAN
SUPERVISORY PATENT EXAMINER